



NOTES

PAPILLOMAVIRUS

HUMAN PAPILLOMAVIRUS

osms.it/human-papillomavirus

PATHOLOGY & CAUSES

- *Human papillomavirus (HPV)*: virus that causes cutaneous and mucosal infections, resulting in warts (verrucae)
- > 200 known types; > 40 transmitted through sexual contact
- *Humans*: only host

Genetic material

- Small, double-stranded, circular DNA virus

Taxonomy

- Papillomaviridae family

Morphology

- Non-enveloped, capsid virus

CAUSES

- Transmission
 - Skin-to-skin contact via breaks in epithelium (autoinoculation causes local spread)
 - Vaginal, anal, oral sexual intercourse
 - Vertical transmission (congenital infection)
- Cutaneous HPV
 - Infection of the basal stem cells of keratinized skin → viral genome replicates within proliferating cells → infected cell eventually reaches the upper epithelial layers → hyperkeratotic growth
- Mucosal HPV
 - → infection of epithelium → integration into the host genome → flat, papular, or pedunculated growths → high-grade lesions and cancer may develop

RISK FACTORS

- Epithelial trauma
- Walking barefoot
- Occupational
 - Meat, poultry, and fish handlers
- Use of communal showers
- Smoking
- Early age of first sexual intercourse
- Multiple sexual partners
- Uncircumcised males
- Immunocompromised state; esp. HIV/AIDS

COMPLICATIONS

- Some types have oncogenic potential

SIGNS & SYMPTOMS

- **Common warts**: *verruca vulgaris* (HPV types 2, 4)
 - Cauliflower-like raised surface located on hands, feet, elbows, knees, subungual/periungual (under, around fingernail/on cuticle; may be painful)
 - Common in children, adolescents
- **Plantar**: *verruca plantaris* (HPV type 1)
 - Located on soles of feet
 - May induce pain when walking
- **Flat**: *verruca plana* (HPV types 3, 20, 28)
 - Flat warts found on arms, face, forehead
 - Common in children, adolescents
- **Anogenital**: *condyloma acuminatum* (HPV types 6, 11 low risk; 15 types have oncogenic potential; types 16 and 18 cause 90% of all genital warts)

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- **Cervical cancer:** types 16 and 18 70% of all cases
- **Anal cancer:** type 16 is the usual cause
- Other cancers; e.g. oropharyngeal, vaginal, **vulvar**, **penile cancers** usually caused by type 16
- Laryngeal papillomatosis (HPV types 6, 11)
 - Larynx, respiratory tract



Figure 86.1 A giant anal condyloma in an immunocompromised male.

DIAGNOSIS

LAB RESULTS

- **Genetic testing:** in situ hybridization/ polymerase chain reaction (PCR)
 - Real-time PCR (detect HPV viral load)
- **Immunohistochemistry:** biomarker detection
 - E6, E7 mRNA
 - p16 cell-cycle protein
- **Cervical lesions:** cytology
 - If positive for abnormal cells: colposcopy and biopsy

TREATMENT

MEDICATIONS

- Cutaneous warts
 - Topical salicylic acid, fluorouracil 5%
- Anogenital warts
 - **External warts:** podofilox solution or gel, sinecatechins ointment, imiquimod cream

SURGERY

- Anogenital warts
 - Surgical removal

OTHER INTERVENTIONS

- Cutaneous warts
 - May resolve spontaneously
 - Cryotherapy (liquid nitrogen)
- Anogenital warts
 - **External or internal (vaginal, cervical, intra-anal):** cryotherapy, trichloroacetic acid, bichloroacetic acid

Prevention

- HPV vaccines
 - Gardasil (quadrivalent), Cervarix (bivalent), 9-valent
 - Both vaccines protect against HPV 16, 18; Gardasil also protects against HPV 6, 11
 - Administered before primary infection occurs (9–13 years old)
- Cervical cancer screening
 - Pap smear
- Effective barrier contraception
 - Condoms (reduces risk; less protection compared to other STIs)
- Decrease number of sexual partners

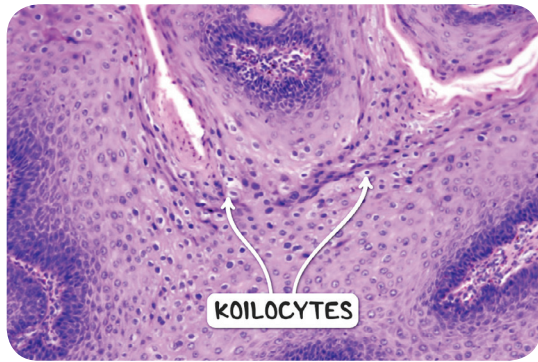


Figure 86.2 The histological appearance of a condyloma. There is hyperkeratosis and parakeratosis. Numerous keratinocytes demonstrate perinuclear clearing known as koilocytosis.